Analisis ekspresi gen ALDH1A1 pada adipose-derived stem cells dan umbilical cord stem cells = Analysing ALDH1A1 gene expression in adipose-derived stem cells and umbilical cord stem cells

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Abstrak

Latar Belakang: ALDH1A1 merupakan gen yang meregulasi diferensiasi dan proliferasi sel dengan jalur asam retinoat. Telah dikenal sebagai gen pluripotensi, ALDH1A1 dapat ditemukan pada Cancer Stem Cell (CSC) dan Mesenchymal Stem Cells (MSC) seperti Adipose-derived Stem Cell (ASC) dan Umbilical Cord Stem Cells (UCSC). Studi ini bertujuan untuk membandingkan relatif ekspresi gen ALDH1A1 pada ASC dan UCSC terhadap ALDH+ Breast CSC (BCSC). Metode: One-step qRT-PCR dilakukan untuk mendeteksi ekspresi mRNA ALDH1A1 pada ekstraksi RNA ASC, UCSC, dan BCSC. Hasil PCR dianalisis dengan BCSC menjadi ekspresi relatif setelah data dinormalisasikan oleh gen 18S.
Hasil: Ekspresi gen ALDH1A1 relatif ditemukan lebih tinggi secara signifikan pada ASC dibandingkan UCSC. Sementara itu, ALDH1A1 lebih rendah diekspresikan pada MSC dibandingkan BCSC.
Konklusi: ASC memiliki kemampuan pluripotensi lebih baik dibandingkan UCSCs pada aspek ALDH1A1. Hal ini disebabkan oleh kemampuan spesifik yang dimiliki ALDH1A1 untuk proliferasi dan diferensiasi ASC.
.....Background: ALDH1A1 is a gene which regulates the cell differentiation and proliferation through retinoic acid pathway. Being a renowned pluripotent gene, ALDH1A1 could be found in both cancer stem cells (CSCs) and human Mesenchymal Stem Cells (MSCs) such as Adipose-derived Stem Cells (ASCs) and Umbilical Cord Stem Cells (UCSCs). This research aimed to compare the expression of ALDH1A1 gene in ASCs and UCSCs relatively towards ALDH+ Breast CSCs (BCSCs).
Method: A one-step qRT-PCR was done to detect the mRNA levels of ALDH1A1 gene in the RNA extraction of ASCs, UCSCs, and BCSCs. The PCR result was analyzed into relative expression with BCSCs, after being normalized with housekeeping 18S gene.
Results: The expression of ALDH1A1 was found to be significantly higher in ASCs than UCSCs, relatively. Furthermore, ALDH1A1 gene was expressed lower in MSCs than BCSCs.
Conclusion: ASCs are discovered to be better in pluripotent capability than UCSCs in the aspect of ALDH1A1. This finding signifies the specific role of ALDH1A1, resulting in contribution of differentiation and proliferative capability to ASCs.

